Having described my invention, I Claim: 09/811,705 NOV 5, 2003 USPEYE11.053

Claim 1 (twice amended): An aspheric mirror for mounting on an automotive vehicle in a specified location having line-of-sight relationships from the vehicle Operator's Two Eyes, whereupon the mirror's surface curvature is developed by a multiplicity of constant sight-line angular iterations **($\Delta\theta$)**, for a right side mirror application in a left to right direction, as a function of the ratio **($\$$)** of the apparent image size seen in the mirror by the right eye divided by the apparent image size seen in the mirror by the left eye; or for a left side mirror application in a right to left direction, as a function of the ratio **($\$$)** of the apparent image size seen in the mirror by the left eye divided by the apparent image size seen in the mirror by the right eye; the beginning points for constant line-of-sight angular iterations **($\Delta\theta$)** for a right side mirror being **LO** for the Left Eye and **RO** for the Right Eye, and for a left side mirror being **RO** for the Right Eye and **LO** for the Left Eye, respectively, where the ($\$$) ratio may range from 1.00 to ~~0.10~~ <u>ZERO,</u> when reflected lines-of-sight from these two beginning points are parallel to each other and direcred straight rearward to infinity.

Claim 2 (twice amended): An aspheric mirror for mounting on an automotive vehicle in a specified location having line-of-sight relationships from the vehicle Operator's Two Eyes, whereupon the mirror's surface curvature is developed by a multiplicity of constant sight-line angular iterations **($\Delta\theta$)**, for a right side mirror application in a left to right direction, as a function of the ratio **($\$$)** of the magnification factor of the apparent image size seen in the mirror by the right eye divided by the magnification factor of the apparent image size seen in the mirror by the left eye; or for a left side mirror application in a right to left direction, as a function of the ratio **($\$$)** of the magnification factor of the apparent image size seen in the miror by the left eye divided by the magnification factor of the apparent image size seen in the mirror by the right eye; wherein the ratio **($\$$)** is a function of the instantaneous magnification factors **(m-right)**^{m} /

(m-left)^{n}__ for a right side mirror, or **(m-left)**^{n}__/ **(m-right)**^{n}__for a left side mirror, as calculated by the formula: **m = (-r) / (2p - (-r))**, with the mirror having **(r)** instantaneous radius of curvature and the object point being located **(p)** distance from the mirror's reflective surface and on a specified **Focus Line**, which **Focus Line** is laterally offset from either the right or left side of the Operator's vehicle and begins at a point directly lateral from the vehicle's mirror being offset from the mirror within a distance range of ZERO-feet to 20-feet and ends within a distance of 20-feet to (∞) ~~,~~ directly rearward from the mirror , being laterally offset from the mirror within a distance range of ZERO-feet to 20-feet; the beginning points for constant line-of-sight angular iterations **($\Delta\theta$)** for a right side mirror being **LO** for the Left Eye and **RO** for the Right Eye, and for a left side mirror being **RO** for the Right Eye and **LO** for the Left Eye, respectively, where the ($) ratio may range from 1.00 to ~~0.10~~ ZERO, when reflected lines-of-sight from these two beginning points are parallel to each other and directed straight rearward to infinity.

Claim 3 (canceled previously): The mirror of Claim 2, wherein the ratio ($) = ($_H) is a function of the instantaneous horizontal magnification factors **(m-right) / (m-left)** for a right side mirror, or **(m-left) / (m-right)** for a letf side mirror, as calculated for each respective value of **(m)** by the formula: **m = (-r) / (2p - (-r))**, with the mirror having **(r)** radius of curvature and the object located **(p)** distance from the mirror's reflective surface on a specified **Focus line**, which is laterally offset from either the right or left side of the principal vehicle as specified, respectively.

Claim 4 (cancel): The mirror of Claim 2, wherein the ratio **($) = ($_E)** is a function of the instantaneous exponential area approximation magnification factors **(m-right)^2 / (m-left)^2** for a right side mirror, or **(m-left)^2 / (m-right)^2** for a left side mirror, as calculated for each respective value of **(m)** by the formula: **m = (-r) / (2p - (-r))**, with the mirror having **(r)** radius of curvature and the

object located **(p)** distance from the mirror's reflective surface on a specified **Focus Line**, which is laterally offset from either the right or left side of the principal vehicle as specified, respectively.

Claim 5 (cancel): The mirror of Claim 2, wherein the ratio **(** $\hat{S}$ **) = (** $\hat{S}_A$ **)** is a function of the instantaneous simulated viewed area magnification factors **((mH-right) (%mV-right) / (mH-left) (%mV-left))** for a right side mirror, or **((mH-left) (%mV-left) / (mH-right) (%mV-right))** for a left side mirror, as calculated for each respective value of **(m)** by the formula: **m = (-r) / (2p - (-r))**, with the mirror having **(r)** radius of curvature and the object located **(p)** distance from the mirror's reflective surface on a specified **Focus Line**, which is laterally offset from either the right or left side of the principal vehicle as specified, respectively; where the % value may range between (0% and 100%).

Claim 6 (cancel): The mirror of Claim 2, wherein the ratio **(** $\hat{S}$ **) = (** $\hat{S}_D$ **)** is a function of the instantaneous simulated volume magnification factors **((mH-horizontal) (mV-vertical) (mG-longitudinal)), ie: ((mHR) (mVR) (mGR) / (mHL) (mVL) (MGL))** for a right side mirror, or **(mHL) (mVL) (mGL) / (mHR) (mVR) (mGR))** for a left side mirror, as calculated for each respective value of **(m)** by the formula: **m = (-r) / (2p - (-r))**, with the mirror having **(r)** radius of curvature and the object located **(p)** distance from the mirror's reflective surface on a specified **Focus Line**, which is laterally offset from either the right or left side of the principal vehicle as specified, respectively; where the horizontal and vertical factors are calculated at a distance **(p)** to the nearest part of the object, and where the longitudinal factor is calculated at a distance **(p)** to a chosen point along the objects true length front to rear.

Claim 7 (twice amended): The ~~mirrors of Claims 1,2, and 3,~~ mirror of Claim 2, having substantially horizontal and vertical datum lines , X-X AXIS and Y-Y AXIS, respectively, originating at and pasing through the **Optical Design C nter** point **LO** for a right side mirror and through said point **RO** for a left side mirror,

where the points **ZRN** for a right side mirror and **ZLN** for a left side mirror are the last points on the horizontal AXIS of the mirror at it's peripheral edge, whereupon the lines **(LO-ZRN)** and **(RO-ZLN)** represent the total distance across the right or left mirror surfaces along the horizontal datum line (X-X AXIS) from points **LO** or **RO**, respectively; whereupon the horizontal line **(LO-ZRN)** or **(RO-ZLN)** is rotated downward clockwise about Optical Design point **LO** for a right side mirror and counterclockwise about Optical Design point **RO** for a left side mirror, respectively, through any desired angular ray displacement up to 90 degrees to the vertical datum line (Y-Y axis) through which rotation the slope angles of the mirror's surface (ϕ_N) are progressively increased to it's peripheral edge point **ZRN** or **ZLN**, respectively, whereat (ϕ_N) is the maximum slope angle of the mirror's surface development, whereupon at the vertical datum line (Y-Y AXIS) the progression may be reversed or continue in any other manner as necessary.

Claim 8 (twice amended): The ~~mirrors of Claims 1, 2, and 3,~~ <u>mirror of Claim 2,</u> having substantially horizontal and vertical datum lines ,X-X AXIS and Y-Y AXIS,_respectively, originating at and pasing through the **Optical Design Center** point **LO** for a right side mirror and through said point **RO** for a left side mirror, where the points **ZRN** for a right side mirror and **ZLN** for a left side mirror are the last points on the horizontal AXIS of the mirror at it's peripheral edge, whereupon the lines **(LO-ZRN)** and **(RO-ZLN)** represent the total distance across the right or left mirror surfaces along the horizontal datum line (X-X AXIS) from points **LO** and **RO**, respectively; whereupon the horizontal line **(LO-ZRN)** or **(RO-ZLN)** is rotated downward clockwise about Optical Design point **LO** for a right side mirror and counterclockwise about Optical Design point **RO** for a left side mirror, respectively, through any desired angular ray displacement up to 90 degrees to the vertical datum line (Y-Y axis) through which rotation the slope angles of the mirror's surface (ϕ_N) remain unchanged, but the line segments **(LO-ZRN)** or **(RO-ZLN)** are progressively foreshortened so as to gradually and

proportionately compress the aspheric surface into a smaller dimension to their peripheral edge points **ZRN** or **ZLN**, respectively, whereat **(ϕ_N)** remains the maximum slope angle of the mirror's surface development throughout the total development up to 90 degrees, whereupon at the vertical datum line (Y-Y AXIS) the progression may be reversed or continue in any other manner as necessary.

Claim 9 (previously canceled): An inside rearview mirror, incorporating any or all of the optical surface characteristics of those mirror's of Claims 1 through 6, enabling said mirror to be able to reflect straight rearward through the rear window, and/or through the right side windows, and/or through the left side windows, of the vehicle; which mirror surface is developed about a nominally centrally located vertical line on it's surface, and the right and left peripheral surfaces of the mirror are developed independently of eachother while sharing a common flat or spherical center portion; or either the right or left peripheral surface is developed, which is then transfered to the opposite side, thus comprising a symmetrically shaped mirror surface.

Claim 10 (twice amended): A fender mounted mirror, applied primarilly to Tractors of Heavy Truck Tractor-Trailer type vehicles and to conventional Straight-Truck types, and to Buses, but not limited thereto, having any or all optical characteristics as disclosed in Claims 1 , 2, ~~3,~~ 7, and 8, which mirror may be designed specifically for either the left or right side location, and is designed to observe road surface areas in front of the vehicle and along side of the front wheels of the Tractor / Truck / Bus, as well as rearward toward or beyond the driving wheels of the Tractor / Truck / Bus.

Claim 11 (amended): For mirrors of Claims 1, 2, 7, and 8, ~~1 through 10,~~ materials for construction of the mirrors may be glass, metal, plastic, or any other material suited to a specific application; and said mirrors may be coated and/or constructed in such a way as to provide, but not limited to: standard reflectivity,

color tinted surfaces, electrochromatic or other light sensitive dimming characteristics, manual or automatic day / night flip dimming capability, etc..

Claim 12 (twice amended): For mirrors of Claims ~~1,2, and 3:~~ 1, 2, 7, and 8, Molds, supporting Fixtures, and Gages, are claimed; disclosed, and may be of glass slump bending, glass press bending, plastic injection molding, plastic thermal-forming, or other types, all of which are fabricated to the optical specifications of any of these Claims; for which, if the mirror is a front (first) surface reflector, the female mold portion is formed substantially to the X-Y -Z data evolved by the processes herein disclosed, and the male portion is formed to X-Y -Z values that compensate for the mirror substrate thickness and for any buffering glass cloth (or otherwise) material introduced between the material being molded, or otherwise formed, and the mold itself.

Claim 13 (twice amended): For mirrors of Claims ~~1,2,and 3,~~ 1, 2, 7, and 8, the **($\hat{S}$)** factor is calculated as a straight line function as shown in Figure 10, beginning at the end of and tangential to the spherical portion or for the full width of the mirror if no constant arc or spherical portion is used.

Claim 14 (twice amended): For mirrors of Claims ~~1,2,and 3,~~ 1, 2, 7, and 8, the **($\hat{S}$)** factor is calculated, as shown in Figure 10, beginning as a circular arc with a straight line depending tangentially therefrom ; or beginning at the end of and tangential to the spherical portion or for the full width of the mirror if no constant arc or spherical portion is used.

Claim 15 (twice amended): For mirrors of Claims ~~1,2,and 3,~~ 1, 2, 7, and 8, the **($\hat{S}$)** factor is calculated as an exponential or other geometric curve expansion beginning at and tangential to the end of the spherical portion, or for the full mirror width if no constant arc or spherical portion is used.

Claim 16 (cancel): For mirrors of Claims 13, 14, and 15, where at any point the positive geometric expansion rate of the ($\hat{S}$) curve begins to slow down and may even eventually reverse itself, becoming negative, thereby slowing down the rate of decrease in the ($\hat{S}$) value, even to the point of causing the ($\hat{S}$) value to begin increasing.

Claim 17 (twice amended): In claims ~~1,2,and 3,~~ 1, 2, 7, and 8, the mirror face size and shape configuration shall be such as to satisfy the design and/or aesthetics of the specifications and design application.

Claim 18 (cancel): An aspheric mirror for mounting on an automotive vehicle in a specified location having line-of-sight relationships from the vehicle Operator's Two Eyes, whereupon the mirror's surface curvature is developed by a multiplicity of constant sight-line angular iterations **($\Delta\theta$)**, for a right side mirror application in a left to right direction, as a function of the ratio ($\hat{S}$) = ($\hat{S}_H$) of the substantially horizontal magnification factor of the apparent image size seen in the mirror by the right eye divided by the substantially horizontal magnification factor of the apparent image size seen in the mirror by the left eye; or for a left side mirror application in a right to left direction, as a function of the ratio ($\hat{S}$) = ($\hat{S}_H$) of the substantially horizontal magnification factor of the apparent image size seen in the miror by the left eye divided by the substantially horizontal magnification factor of the apparent image size seen in the mirror by the right eye; wherein the ratio ($\hat{S}_H$) is a function of the instantaneous magnification factors **(m-right) / (m-left)** for a right side mirror, or **(m-left) / (m-right)** for a left side mirror, as calculated by the formula: **m = (-r) / (2p - (-r))**, with the mirror having **(r)** instantaneous radius of curvature and the object point being located **(p)** distance from the mirror's reflective surface and on a specified **Focus Line,** which **Focus Line** is laterally offset from either the right or left side of the Operator's vehicle and begins at a point directly lateral from the vehicle's mirror being offset from the mirror within a distance range of

ZERO-feet to 20-feet and ends within a distance of 20-feet to (∞) directly rearward from the mirror, being laterally offset from the mirror within a distance range of ZERO-feet to 20-feet; the beginning points for constant line-of-sight angular iterations **(** $\Delta\theta$**)** for a right side mirror being **LO** for the Left Eye and **RO** for the Right Eye, and for a left side mirror being **RO** for the Right Eye and **LO** for the Left Eye, respectively, where the (ς_H) ratio may range from 1.00 to 0.10, when reflected lines-of-sight from these two beginning points are parallel to each other and directed straight rearward to infinity.

Claim 19 (amended): An inside rearview mirror, incorporating any or all of the optical surface characteristics of those mirror's of Claims ~~1,2,and 3,~~ 1, 2, 7, and 8, enabling said mirror to be able to reflect straight rearward through the rear window, and/or through the right side windows, and/or through the left side windows, of the vehicle; which mirror surface is developed about a nominally centrally located vertical Y-Y AXIS on it's surface, and the right and left sections of the mirror are developed independently of eachother while sharing a common spherical center portion ; or either the right or left peripheral surface is developed, which is then transfered to the opposite side, thus comprising a symmetrically shaped mirror surface.